

**CLAIMS**

What is claimed is:

1. A semiconductor with integrated monitoring comprising:  
a first semiconductor formed on a predetermined substrate;  
a passivation layer formed on top of said first semiconductor device; and  
a monitoring device formed on top of said passivation layer.
2. The semiconductor as recited in claim 1, wherein said first semiconductor device is an active device.
3. A semiconductor with integrated monitoring comprising:  
a first semiconductor formed on a GaAs substrate;  
a passivation layer formed on top of said first semiconductor device; and  
a monitoring device formed on top of said passivation layer.
4. A semiconductor with integrated monitoring comprising:  
a first semiconductor formed on a InP substrate;  
a passivation layer formed on top of said first semiconductor device; and  
a monitoring device formed on top of said passivation layer
5. A semiconductor with integrated monitoring comprising:  
a first semiconductor formed on a GaN substrate;  
a passivation layer formed on top of said first semiconductor device; and  
a monitoring device formed on top of said passivation layer
6. The semiconductor as recited in claim 2, wherein said active device is an amplifier.
7. The semiconductor as recited in claim 1, wherein said first semiconductor device is a light emitting device.

8. The semiconductor as recited in claim 6, wherein said light emitting device is a laser.
9. The semiconductor as recited in claim 8, wherein said laser is a vertical cavity surface emitting laser (VCSEL).
10. The semiconductor as recited in claim 1, wherein said monitoring device is a light transmitting device.
11. The semiconductor as recited in claim 1, wherein said monitoring device is a light receiving device.
12. The semiconductor as recited in claim 10, wherein said light transmitting device is a photodiode.
13. The semiconductor as recited in claim 11, wherein said light receiving device is a photodetector.
14. A process for forming a semiconductor device with integrated monitoring comprising the steps of:
  - a) forming a first semiconductor device on a substrate;
  - b) forming a passivation layer on top of said first semiconductor device; and
  - c) forming a monitoring device on top of said passivation layer.
15. A process for forming a semiconductor device with integrated monitoring comprising the steps of:
  - a) forming a first active semiconductor device on a substrate;
  - b) forming a passivation layer on top of said first semiconductor device; and
  - c) forming a monitoring device on top of said passivation layer.

16. A process for forming a semiconductor device with integrated monitoring comprising the steps of:
  - a) forming a first active semiconductor device on a GaAs substrate;
  - b) forming a passivation layer on top of said first semiconductor device; and
  - c) forming a monitoring device on top of said passivation layer.
17. A process for forming a semiconductor device with integrated monitoring comprising the steps of:
  - a) forming a first active semiconductor device on a InP substrate;
  - b) forming a passivation layer on top of said first semiconductor device; and
  - c) forming a monitoring device on top of said passivation layer.
18. A process for forming a semiconductor device with integrated monitoring comprising the steps of:
  - a) forming a first active semiconductor device on a GaN substrate;
  - b) forming a passivation layer on top of said first semiconductor device; and
  - c) forming a monitoring device on top of said passivation layer.
19. The process as recited in claim 14, wherein step (a) includes forming a light emitting device on said substrate.
20. The process as recited in claim 14, wherein step (c) includes forming a light transmitting device on said passivation layer.
21. The process as recited in claim 14, wherein step (c) includes forming a light receiving device on said passivation layer.
22. A process for forming a semiconductor device with integrated monitoring comprising the steps of:
  - a) forming a first semiconductor device on a substrate;
  - b) forming a passivation layer on top of said first semiconductor device; and

c) forming a light receiving device on top of said passivation layer using a low pressure chemical vapor deposition process to deposit an amorphous silicon composition.

090947-062904  
090947-062904